

# SANITARY SEWERS

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## Sanitary Sewers

### Proposed FY 2018 – FY 2027 Capital Improvement Program

### Summary of Projects

Note: Projects with \$0 total funding are active capital projects funded in prior CIP's that do not require additional resources.

	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27	TOTAL FY 18 - 27
Sanitary Sewers											
Sanitary Sewers											
AlexRenew Wastewater Treatment Plant Capacity	0	0	11,070,000	11,400,000	11,750,000	0	0	0	0	0	34,220,000
Citywide Sewershed Infiltration & Inflow	0	2,375,000	3,075,000	2,850,000	4,000,000	0	0	0	0	0	12,300,000
Combined Sewer Assessment & Rehabilitation	0	3,700,000	2,550,000	2,550,000	0	0	0	0	0	0	8,800,000
Combined Sewer Outfall (001 - 004)	1,000,000	0	790,000	41,327,000	70,451,000	58,532,000	60,243,000	77,625,000	60,245,000	0	370,213,000
Combined Sewer Overflow Planning	0	0	0	0	0	0	0	0	0	0	-
Combined Sewer Separation Projects	300,000	300,000	300,000	600,000	300,000	300,000	600,000	300,000	300,000	600,000	3,900,000
Combined Sewer System (CSS) Permit Compliance	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	3,000,000
Four Mile Run Sanitary Sewer Repair	0	0	0	0	0	0	0	0	0	0	-
Holmes Run Trunk Sewer	0	0	0	0	0	0	0	0	0	0	-
Reconstructions & Extensions of Sanitary Sewers	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	9,000,000
Wet Weather Management Facility	2,250,000	8,750,000	9,000,000	0	0	0	0	0	0	0	20,000,000
<b>Sanitary Sewers Total</b>	<b>4,750,000</b>	<b>16,325,000</b>	<b>27,985,000</b>	<b>59,927,000</b>	<b>87,701,000</b>	<b>60,032,000</b>	<b>62,043,000</b>	<b>79,125,000</b>	<b>61,745,000</b>	<b>1,800,000</b>	<b>461,433,000</b>
<b>Grand Total</b>	<b>4,750,000</b>	<b>16,325,000</b>	<b>27,985,000</b>	<b>59,927,000</b>	<b>87,701,000</b>	<b>60,032,000</b>	<b>62,043,000</b>	<b>79,125,000</b>	<b>61,745,000</b>	<b>1,800,000</b>	<b>461,433,000</b>

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## Sanitary Sewers Ten-Year Plan

### Proposed FY 2018 – FY 2027 Capital, Operating and Debt Service

Sanitary Sewer Rate	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Total FY 18-27
Sanitary Sewer Rate (\$ per 1,000 gallons)	\$1.40	\$1.82	\$2.28	\$2.73	\$3.28	\$4.26	\$5.32	\$6.12	\$7.65	\$8.42	
Proposed Rate Increase	30.0%	25.0%	20.0%	20.0%	30.0%	25.0%	15.0%	25.0%	10.0%	5.0%	
New Sanitary Sewer Rate	\$1.82	\$2.28	\$2.73	\$3.28	\$4.26	\$5.32	\$6.12	\$7.65	\$8.42	\$8.84	

Revenues	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Total FY 18-27
Sewer Line Maintenance Fee	8,867,531	11,167,547	13,501,565	16,323,392	21,379,562	26,924,886	31,195,846	39,287,269	43,540,116	46,060,000	258,247,716
Sewer Connection Fee	3,000,000	2,200,000	2,310,000	2,425,500	2,546,775	2,674,114	2,807,819	2,920,132	3,036,938	3,158,415	27,079,693
New Debt Issuance	2,500,000	10,255,000	22,485,000	38,627,000	60,076,000	38,007,000	53,718,000	68,800,000	53,420,000	975,000	348,863,000
Fund Balance	700,000	0	0	0	750,000	300,000	0	0	0	0	1,750,000
Prior Year Carryover	0	0	904,956	1,730,632	1,165,370	346,245	764,532	223,683	1,175,271	1,650,483	7,961,173
Interjurisdictional Contributions	0	3,570,000	3,575,000	14,200,000	18,300,000	14,200,000	0	0	0	0	53,845,000
State CSO Capital Share	0	0	0	5,000,000	8,500,000	7,000,000	7,500,000	9,500,000	7,500,000	0	45,000,000
<b>Total Revenues</b>	<b>15,067,532</b>	<b>27,192,547</b>	<b>42,776,520</b>	<b>78,306,524</b>	<b>112,717,708</b>	<b>89,452,245</b>	<b>95,986,198</b>	<b>120,731,085</b>	<b>108,672,325</b>	<b>51,843,898</b>	<b>742,746,582</b>

<b>All Operating</b>	7,764,192	7,997,591	8,425,474	9,223,103	9,924,374	10,677,953	11,321,828	12,322,376	12,977,563	13,481,342	104,115,796
<b>All Capital Projects</b>	4,750,000	14,825,000	27,060,000	58,827,000	87,876,000	60,207,000	62,218,000	79,300,000	61,920,000	1,975,000	458,958,000
<b>All Debt Service</b>	2,553,340	3,465,001	5,560,414	9,091,051	14,571,089	17,802,760	22,222,687	27,933,437	32,124,279	31,374,519	166,698,576
<b>Total Expenditures</b>	<b>15,067,532</b>	<b>26,287,592</b>	<b>41,045,888</b>	<b>77,141,154</b>	<b>112,371,463</b>	<b>88,687,713</b>	<b>95,762,515</b>	<b>119,555,813</b>	<b>107,021,842</b>	<b>46,830,861</b>	<b>729,772,372</b>

Operating Costs	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Total FY 18-27
T&ES Personnel Charges (incl. Worker's Comp)	3,187,045	3,282,657	3,381,137	3,482,571	3,587,048	3,694,659	3,805,499	3,919,664	4,037,254	4,158,371	36,535,904
Additional Personnel & Consulting Services	770,000	793,100	816,893	841,400	866,642	892,641	919,420	947,003	975,413	1,004,675	8,827,187
DPI and DEC Personnel Charges	612,495	630,870	649,796	669,290	689,368	710,049	731,351	753,291	775,890	799,167	7,021,566
Indirect Costs (Tr to G.F.)	1,060,435	1,229,814	1,454,664	1,724,898	2,201,223	2,723,108	3,128,337	3,883,081	4,285,089	4,528,094	26,218,744
Sewer Jet Cleaning	251,206	258,742	266,504	274,500	282,735	291,217	299,953	308,952	318,220	327,767	2,879,795
Corrective Maintenance	86,168	88,753	91,416	94,158	96,983	99,892	102,889	105,976	109,155	112,430	987,820
Other Non-Personnel (Training, Utilities, Rentals, etc.)	252,092	122,562	126,239	130,026	133,927	137,944	142,083	146,345	150,736	155,258	1,497,210
Equipment Replacement	242,130	249,394	256,876	264,582	272,519	280,695	289,116	297,789	306,723	315,925	2,775,749
Sanitary Sewer Capacity Study - Flow Metering, Sewer Modeling, CMOM	450,000	463,500	477,405	491,727	506,479	521,673	537,324	553,443	570,047	587,148	5,158,746
Sewer Billing	150,000	154,500	159,135	163,909	168,826	173,891	179,108	184,481	190,016	195,716	1,719,582
Annual CCTV of Sewers	319,368	328,949	338,818	348,982	359,451	370,235	381,342	392,782	404,566	416,703	3,661,196
Heavy Cleaning of Sewers	293,253	302,051	311,112	320,445	330,059	339,961	350,159	360,664	371,484	382,629	3,361,817
Wet Weather Management Facility Operating	0	0	0	318,270	327,818	337,653	347,782	358,216	368,962	380,031	2,438,732
Rodent Abatement in Sewers	90,000	92,700	95,481	98,345	101,296	104,335	107,465	110,689	114,009	117,430	1,031,749
<b>Subtotal, Operating Costs</b>	<b>7,764,192</b>	<b>7,997,591</b>	<b>8,425,474</b>	<b>9,223,103</b>	<b>9,924,374</b>	<b>10,677,953</b>	<b>11,321,828</b>	<b>12,322,376</b>	<b>12,977,563</b>	<b>13,481,342</b>	<b>104,115,796</b>

**Sanitary Sewers Ten-Year Plan**  
**Proposed FY 2018 – FY 2027 Capital, Operating and Debt Service**  
(continued)

<b>Capital Projects</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Total FY 18-27</b>
Reconstruction and Extension of Sanitary Sewers	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	<b>9,000,000</b>
Wet Weather Management Facility	2,250,000	8,750,000	9,000,000	0	0	0	0	0	0	0	<b>20,000,000</b>
Sewer Separation Projects	300,000	300,000	300,000	600,000	300,000	300,000	600,000	300,000	300,000	600,000	<b>3,900,000</b>
Green Infrastructure in CSO Areas	0	350,000	350,000	175,000	175,000	175,000	175,000	175,000	175,000	175,000	<b>1,925,000</b>
Combined Sewer Permit Compliance	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	<b>3,000,000</b>
Citywide Sewershed Rehab and I&I Red.	0	2,375,000	3,075,000	2,850,000	4,000,000	0	0	0	0	0	<b>12,300,000</b>
Combined Sewer Assessment and Rehab*	0	1,850,000	1,275,000	1,275,000	0	0	0	0	0	0	<b>4,400,000</b>
AlexRenew WWTP Expansion	0	0	11,070,000	11,400,000	11,750,000	0	0	0	0	0	<b>34,220,000</b>
Outfall 001	750,000	0	0	0	10,189,000	10,189,000	47,380,000	61,053,000	47,380,000	0	<b>176,941,000</b>
Outfall 002	250,000	0	0	0	7,016,000	7,016,000	12,863,000	16,572,000	12,865,000	0	<b>56,582,000</b>
Outfall 003 and 004	0	0	790,000	41,327,000	53,246,000	41,327,000	0	0	0	0	<b>136,690,000</b>
<b>Subtotal, Capital Projects</b>	<b>4,750,000</b>	<b>14,825,000</b>	<b>27,060,000</b>	<b>58,827,000</b>	<b>87,876,000</b>	<b>60,207,000</b>	<b>62,218,000</b>	<b>79,300,000</b>	<b>61,920,000</b>	<b>1,975,000</b>	<b>458,958,000</b>
<b>Debt Service</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Total FY 18-27</b>
Debt Service Payments	2,553,340	3,465,001	5,560,414	9,091,051	14,571,089	17,802,760	22,222,687	27,933,437	32,124,279	31,374,519	<b>166,698,576</b>
<b>Total, All Categories</b>	<b>15,067,532</b>	<b>26,287,592</b>	<b>41,045,888</b>	<b>77,141,154</b>	<b>112,371,463</b>	<b>88,687,713</b>	<b>95,762,515</b>	<b>119,555,813</b>	<b>107,021,842</b>	<b>46,830,861</b>	<b>729,772,372</b>

## ALEXRENEW WASTEWATER TREATMENT PLANT CAPACITY

**DOCUMENT SUBSECTION:** Sanitary Sewers  
**MANAGING DEPARTMENT:** Department of Transportation  
 and Environmental Services

**PROJECT LOCATION:** 1500 Eisenhower Ave.  
**REPORTING AREA:** Southwest Quadrant

**PRIMARY STRATEGIC THEME:** Theme 8: Environmental  
 Sustainability

**PROJECT CATEGORY:** 3  
**ESTIMATE USEFUL LIFE:** 21 - 25 Years

AlexRenew Wastewater Treatment Plant Capacity													
	A (B + M)	B	C	D	E	F	G	H	I	J	K	L	M (C:L)
	Total Budget & Financing	Through 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Total FY 2018 FY 2027
Expenditure Budget	34,220,000	0	0	0	11,070,000	11,400,000	11,750,000	0	0	0	0	0	34,220,000
Financing Plan													
GO Bonds (Sanitary)	34,220,000	0	0	0	11,070,000	11,400,000	11,750,000	0	0	0	0	0	34,220,000
GO Bonds - Sanitary Sewer	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Financing Plan	34,220,000	0	0	0	11,070,000	11,400,000	11,750,000	0	0	0	0	0	34,220,000
Additional Operating Impact													
Annual Impact	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Additional Operating Impact	0	0	0	0	0	0	0	0	0	0	0	0	0

### CHANGES FROM PRIOR YEAR CIP

No changes from prior CIP.

### PROJECT DESCRIPTION & JUSTIFICATION

The City's Department of Planning and Zoning (P&Z) has developed growth forecasts for build-out conditions (post year 2040) as presented in the Sanitary Sewer Master Plan. Based on these forecasts, the City is projected to exceed its wastewater allocation at the Alexandria Renew Enterprises (AlexRenew) Water Resource Recovery Facility by approximately 4 million gallons per day (mgd) beginning sometime after 2040.

AlexRenew has indicated that their facility can be expanded/upgraded to treat this additional 4 mgd at a total capital cost of \$34.2 million (increased for inflation). This cost is based on hydraulically expanding the plant at the same time as other anticipated upgrades are needed (as existing process equipment reaches the end of its useful life). Although the need for an additional 4 mgd is not anticipated until after 2040, it would be more cost-effective to perform the hydraulic expansion while other upgrades are occurring based on the timeline provided by AlexRenew.

The costs provided do not include any additional nutrient (phosphorous and nitrogen) loads associated with these flows, which the City will reach around 2040. Options for addressing these added nutrient loads have been identified in the Sanitary Sewer Master Plan and will continue to be evaluated. Funding for this project is not planned until FY 2020 – 2022. Recent discussions with AlexRenew have indicated that flows are increasing at their wastewater treatment facility at a lower rate than what was projected in the Sanitary Sewer Master Plan. However, development/redevelopment projections may need to be adjusted in flow models to account for changes in development densities in amendments to several small area plans. The City is continuing to work with AlexRenew to monitor the flows at the treatment facility.

### EXTERNAL OR INTERNAL ADOPTED PLAN OR RECOMMENDATION

Sanitary Sewer Master Plan

### ADDITIONAL OPERATING IMPACTS

No additional operating impacts identified at this time.

## CITYWIDE SEWERSHED INFILTRATION & INFLOW

**DOCUMENT SUBSECTION:** Sanitary Sewers  
**MANAGING DEPARTMENT:** Department of Transportation  
 and Environmental Services

**PROJECT LOCATION:** Citywide  
**REPORTING AREA:** Citywide

**PRIMARY STRATEGIC THEME:** Theme 8: Environmental  
 Sustainability

**PROJECT CATEGORY:** 2  
**ESTIMATE USEFUL LIFE:** 30+ Years

Citywide Sewershed Infiltration & Inflow													
	A (B + M)	B	C	D	E	F	G	H	I	J	K	L	M (C:L)
	Total Budget & Financing	Through 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Total FY 2018 FY 2027
Expenditure Budget	32,161,440	19,861,440	0	2,375,000	3,075,000	2,850,000	4,000,000	0	0	0	0	0	12,300,000
Financing Plan													
GO Bonds (Sanitary)	12,300,000	0	0	2,375,000	3,075,000	2,850,000	4,000,000	0	0	0	0	0	12,300,000
GO Bonds - Sanitary Sewer	15,750,000	15,750,000	0	0	0	0	0	0	0	0	0	0	0
Sanitary Sewer Fees	4,111,440	4,111,440	0	0	0	0	0	0	0	0	0	0	0
Total Financing Plan	32,161,440	19,861,440	0	2,375,000	3,075,000	2,850,000	4,000,000	0	0	0	0	0	12,300,000
Additional Operating Impact													
Annual Impact	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Additional Operating Impact	0	0	0	0	0	0	0	0	0	0	0	0	0

### CHANGES FROM PRIOR YEAR CIP

FY 2018 funding for project eliminated.

### PROJECT DESCRIPTION & JUSTIFICATION

Portions of the sanitary sewer system located in the City are aging, deteriorated and require maintenance. During wet weather, infiltration and inflow into the sanitary sewers can result in over-capacity conditions that cause overflows into the environment or customers' basements. This CIP program provides for evaluation, remediation and rehabilitation of infiltration/inflow and deficient conditions for the sanitary sewer system across the entire city.

Rehabilitation of sanitary sewers and manholes in the Holmes Run Sewersheds, which impacts the Alexandria West, Landmark/Van Dorn West, and Seminary Hill/Strawberry Hill will be completed in FY 2017. Following completion of the rehabilitation projects, post-construction flow monitoring will be conducted in FY 2018 to assess the amount of infiltration and inflow removed as a result of the rehabilitation. In addition, this program will be phased into broader infrastructure issues related to infiltration and inflow across the entire sanitary sewer system to ensure dependable service in the future. This will include performing flow monitoring throughout the system and rehabilitation of sanitary sewers discovered to have sewer defects as part of the City's annual CCTV contract.

Completion of this project will help mitigate sanitary sewer overflows. Additionally, it will improve the City's sanitary sewer infrastructure and extend the infrastructure's useful life by reducing the potential of pipe collapse and other emergency repairs.

### EXTERNAL OR INTERNAL ADOPTED PLAN OR RECOMMENDATION

Sanitary Sewer Master Plan

### ADDITIONAL OPERATING IMPACTS

No additional operating impacts identified at this time.



## COMBINED SEWER ASSESSMENT & REHABILITATION

DOCUMENT SUBSECTION: Sanitary Sewers

PROJECT LOCATION: CSO 001 - Pendleton St. at  
Potomac RiverMANAGING DEPARTMENT: Department of Transportation  
and Environmental Services

REPORTING AREA: Old Town North

PRIMARY STRATEGIC THEME: Theme 8: Environmental  
SustainabilityPROJECT CATEGORY: 3  
ESTIMATE USEFUL LIFE: 30+ Years

Combined Sewer Assessment & Rehabilitation													
	A (B + M)	B	C	D	E	F	G	H	I	J	K	L	M (C:L)
	Total Budget & Financing	Through 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Total FY 2018 - FY 2027
Expenditure Budget	8,800,000	0	0	3,700,000	2,550,000	2,550,000	0	0	0	0	0	0	8,800,000
Financing Plan													
GO Bonds	0	0	0	0	0	0	0	0	0	0	0	0	0
GO Bonds (Sanitary)	4,400,000	0	0	1,850,000	1,275,000	1,275,000	0	0	0	0	0	0	4,400,000
GO Bonds (Stormwater)	4,400,000	0	0	1,850,000	1,275,000	1,275,000	0	0	0	0	0	0	4,400,000
GO Bonds - Sanitary Sewer	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Financing Plan	8,800,000	0	0	3,700,000	2,550,000	2,550,000	0	0	0	0	0	0	8,800,000
Additional Operating Impact													
Annual Impact	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Additional Operating Impact	0	0	0	0	0	0	0	0	0	0	0	0	0

### CHANGES FROM PRIOR YEAR CIP

No changes from prior CIP.

### PROJECT DESCRIPTION & JUSTIFICATION

This project provides for the condition assessment of sewers in the combined sewer service area in Old Town and remediation of structurally deficient sewers.

The City will perform condition assessments including cleaning and televising of the lines, assessing information to determine condition of lines, and determining if rehabilitation is needed. Structurally deficient sewers will be identified and the results of the field work will be evaluated to develop remediation projects which are expected to include the relining of sewers and manhole repairs. Funding is not planned until FY 2019, and project funding totals \$8.8 million.

In addition to the health and environmental benefits of this project, completion of this project will repair and renew the City's sewer infrastructure, extend the infrastructure's useful life, and reduce the number of pipe collapses and other emergency repairs.

### EXTERNAL OR INTERNAL ADOPTED PLAN OR RECOMMENDATION

N/A

### ADDITIONAL OPERATING IMPACTS

No additional operating impacts identified at this time.

## COMBINED SEWER OUTFALL (001 - 004)

**DOCUMENT SUBSECTION:** Sanitary Sewers  
**MANAGING DEPARTMENT:** Department of Transportation  
 and Environmental Services

**PROJECT LOCATION:** Southwest Quadrant  
**REPORTING AREA:** Southwest Quadrant

**PRIMARY STRATEGIC THEME:** Theme 8: Environmental  
 Sustainability

**PROJECT CATEGORY:** 3  
**ESTIMATE USEFUL LIFE:** 30+ Years

Combined Sewer Outfall (001 - 004)													
	A (B + M)	B	C	D	E	F	G	H	I	J	K	L	M (C:L)
	Total Budget & Financing	Through 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Total FY 2018 - FY 2027
Expenditure Budget	370,213,000	0	1,000,000	0	790,000	41,327,000	70,451,000	58,532,000	60,243,000	77,625,000	60,245,000	0	370,213,000
Financing Plan													
GO Bonds (Sanitary)	276,723,000	0	0	0	0	22,127,000	43,651,000	37,332,000	52,743,000	68,125,000	52,745,000	0	276,723,000
Interjurisdictional Contributions	47,490,000	0	0	0	790,000	14,200,000	18,300,000	14,200,000	0	0	0	0	47,490,000
Sanitary Sewer Fund	1,000,000	0	1,000,000	0	0	0	0	0	0	0	0	0	1,000,000
State CSO Capital Share	45,000,000	0	0	0	0	5,000,000	8,500,000	7,000,000	7,500,000	9,500,000	7,500,000	0	45,000,000
Total Financing Plan	370,213,000	0	1,000,000	0	790,000	41,327,000	70,451,000	58,532,000	60,243,000	77,625,000	60,245,000	0	370,213,000
Additional Operating Impact													
Annual Impact	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Additional Operating Impact	0	0	0	0	0	0	0	0	0	0	0	0	0

### CHANGES FROM PRIOR YEAR CIP

This is a new project for FY 2018.

### PROJECT DESCRIPTION & JUSTIFICATION

The FY2018 Sanitary Sewer Ten-Year Plan shows \$370.2 million in order to comply with a recent State mandate that is likely to come out of the 2017 Virginia General Assembly session. This new accelerated mandate requires the City of Alexandria (City) to address combined sewer discharges from all four of its outfalls. This assumes the General Assembly approves the House bill which mandates construction for each outfall commencing no later than July 1, 2024. This is a very aggressive schedule and one that the City believes is too optimistic. However, if that is what the General Assembly approves, this will be the City's good faith plan to implement.

Prior to this recent development, the City had submitted a Long Term Control Plan Update (LTCPU) for its combined sewer system (CSS) to the Virginia Department of Environmental Quality (VDEQ), which had required an update due to new regulatory requirements related to the Hunting Creek Bacteria Total Maximum Daily Load (TMDL), which requires significant reductions in combined sewer discharges from three of the City's four outfalls (CSO-002/003/004), to be implemented no later than 2035. The LTCPU also provided planning measures to address the fourth remaining outfall (CSO-001). The mandates being considered by the General Assembly would likely supersede the LTCPU submitted by the City.

This project page demonstrates the preliminary project funding (in future dollars) and timing that would be necessary to meet the State requirement of commencing construction on all four outfalls no later than July 1, 2024. The project cost is a preliminary estimate and will be refined as project planning commences. While this CIP reflects outfalls 003 and 004 as a City financed and constructed project, discussions with AlexRenew (which operates the nearby wastewater treatment plant) may result in AlexRenew financing and constructing the 003 and 004 facility, and then reflecting those costs in their customer rates.

This project includes \$1,000,000 in funding for FY 2018 to ramp up the City's efforts for planning and implementing work at the four CSO's. The City is assuming both interjurisdictional contributions (\$47.5 million) and State aid (\$45 million), such as the cities of Richmond and Lynchburg received, to help offset a portion of this project cost. Despite these offsetting funding sources, the City will still need to consider significant year-over-year double digit increases in Sanitary Sewer fees to fund this project on the State mandated timeline.

### EXTERNAL OR INTERNAL ADOPTED PLAN OR RECOMMENDATION

Sanitary Sewer Master Plan; City's Long Term Control Plan  
 Update for the Combined Sewer System

### ADDITIONAL OPERATING IMPACTS

No additional operating impacts identified at this time.

## COMBINED SEWER SEPARATION PROJECTS

**DOCUMENT SUBSECTION:** Sanitary Sewers  
**MANAGING DEPARTMENT:** Department of Transportation  
 and Environmental Services

**PROJECT LOCATION:** Old Town CSO Area  
**REPORTING AREA:** Old Town/Old Town  
 North/Braddock Metro

**PRIMARY STRATEGIC THEME:** Theme 8: Environmental  
 Sustainability

**PROJECT CATEGORY:** 3  
**ESTIMATE USEFUL LIFE:** 30+ Years

Combined Sewer Separation Projects													
	A (B + M)	B	C	D	E	F	G	H	I	J	K	L	M (C:L)
	Total Budget & Financing	Through 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Total FY 2018 FY 2027
Expenditure Budget	7,525,000	3,625,000	300,000	300,000	300,000	600,000	300,000	300,000	600,000	300,000	300,000	600,000	3,900,000
Financing Plan													
GO Bonds (Sanitary)	900,000	0	0			300,000	0	0	300,000	0	0	300,000	900,000
Sanitary Sewer Fund	3,000,000	0	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	3,000,000
Sanitary Sewer Fees	3,625,000	3,625,000	0	0	0	0	0	0	0	0	0	0	0
Total Financing Plan	7,525,000	3,625,000	300,000	300,000	300,000	600,000	300,000	300,000	600,000	300,000	300,000	600,000	3,900,000
Additional Operating Impact													
Annual Impact	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Additional Operating Impact	0	0	0	0	0	0	0	0	0	0	0	0	0

### CHANGES FROM PRIOR YEAR CIP

Overall project funding increased by \$1.2 million.

### PROJECT DESCRIPTION & JUSTIFICATION

This project provides funding for the City to proactively separate small areas of combined sewers. Areas of opportunity exist for separation of combined sewer systems where construction of additional sewers a few blocks away due to new development may result in completing the separation of a larger area. Opportunities may also arise in conjunction with redevelopment in the combined sewer area. The City's Long Term Control Plan Update (LTCPU) for the CSS proposes targeted sewer separation as a complementary strategy.

In 2011, City staff identified portions of the King and West combined sewershed where separation may be achieved by disconnecting sanitary sewers from the combined sewer system and reconnecting to the Potomac Yard Trunk Sewer, which was designed to accommodate separated sanitary flow from this area. This project (Payne and Fayette Sewer Separation Project) was completed in FY2017 and resulted in the separation of approximately 90 sanitary laterals from the combined sewer system (CSS), meeting one of the requirements of the City's 2013-2018 CSS permit and decreasing the bacteria loading into Hooffs Run during rain events.

Additional funding has been added to the FY 2018-2027 CIP for sewer separation consistent with the LTCPU submitted to the Virginia Department of Environmental Quality (VDEQ) in August 2016. The LTCPU is currently being reviewed for approval by VDEQ. The City is currently in the process of identifying other areas of opportunity for sewer separation in the CSO-001 (Oronoco Bay) combined sewershed.

For the City to stay in compliance with future CSS permits, overflows from the Combined Sewer System need to be mitigated. This is primarily because of new regulatory requirements of the bacteria TMDL for Hunting Creek. The estimated total cost of mitigation of these overflows into Hunting Creek is estimated to cost \$193.3 million. In the current CSS permit cycle (2013-2018), the City is required to continue implementation of Nine Minimum Controls, along with other initiatives including implementation of the Area Reduction Plan, outfall improvements, green infrastructure, and select City-led sewer separation projects. The City will also need to continue extensive monitoring, sampling, inspections, and reporting.

### EXTERNAL OR INTERNAL ADOPTED PLAN OR RECOMMENDATION

T&ES Strategic Plan 2012-2015: Key Result Area III: Meet or exceed state or federal requirements of City's separate storm sewer and combined sewer system permits and maintain compliance with these environmental permits; Consistent with Eco-City Charter (Water Resources) and with Eco-City Action Plan, Chapter 4, Goal 4: Eliminate the harmful impact of combined sewer systems in the long-term, and minimize them in the short-term; City's Long Term Control Plan Update for the Combined Sewer System

### ADDITIONAL OPERATING IMPACTS

No additional operating impacts identified at this time.

## COMBINED SEWER SYSTEM (CSS) PERMIT COMPLIANCE

**DOCUMENT SUBSECTION:** Sanitary Sewers  
**MANAGING DEPARTMENT:** Department of Transportation  
 and Environmental Services

**PROJECT LOCATION:** Old Town CSO Area  
**REPORTING AREA:** Old Town

**PRIMARY STRATEGIC THEME:** Theme 8: Environmental  
 Sustainability

**PROJECT CATEGORY:** 1  
**ESTIMATE USEFUL LIFE:** Varies

Combined Sewer System (CSS) Permit Compliance													
	A (B + M)	B	C	D	E	F	G	H	I	J	K	L	M (C:L)
	Total Budget & Financing	Through 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Total FY 2018 FY 2027
Expenditure Budget	10,985,440	7,985,440	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	3,000,000
Financing Plan													
Sanitary Sewer Fund	3,000,000	0	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	3,000,000
GO Bonds - Sanitary Sewer	245,072	245,072	0	0	0	0	0	0	0	0	0	0	0
Sanitary Sewer Fees	7,740,368	7,740,368	0	0	0	0	0	0	0	0	0	0	0
Total Financing Plan	10,985,440	7,985,440	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	3,000,000
Additional Operating Impact													
Annual Impact	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Additional Operating Impact	0	0	0	0	0	0	0	0	0	0	0	0	0

### CHANGES FROM PRIOR YEAR CIP

Funding added for FY 2027.

### PROJECT DESCRIPTION & JUSTIFICATION

The City's combined sewer system (sanitary and storm sewers) comprises approximately 540 acres located in the Old Town area. During certain wet weather events, flows in excess of the sewer pipes carrying capacity are discharged into receiving waterways via one of four combined sewer outfalls. These discharges are permitted by the Virginia Department of Environmental Quality (VDEQ). The Hunting Creek Bacteria Total Maximum Daily Load (TMDL) requires reductions in these discharges from 3 of the 4 permitted outfalls (002, 003, and 004). The Virginia General Assembly is likely to mandate reductions in the fourth outfall (001) at a cost of \$176.9 million.

Funding ensures compliance with Commonwealth and Federal statutes and permits, and will continue to improve the City's combined sewer system. For the City to stay in compliance with future CSS permits, overflows from the Combined Sewer System need to be mitigated. This is primarily because of new regulatory requirements of the bacteria TMDL for Hunting Creek. The estimated total cost of mitigation of these overflows into Hunting Creek is estimated to cost \$193.3 million.

The City received a new permit in August 2013 which requires the City to develop a Long-Term Control Plan (LTCP) update that complies with the TDML requirements, to submit the plan by August 2016, and to implement the plan no later than 2035. In the current CSS permit cycle (2013-2018), along with submitting the Long Term Control Plan Update to VDEQ for review and approval, the City is required to continue implementation of Nine Minimum Controls, along with other initiatives including implementation of the Area Reduction Plan (sewer separation as a condition of redevelopment), outfall improvements, green infrastructure, and select City-led sewer separation projects. The City will also need to continue extensive monitoring, sampling, inspections, and reporting.

Approval and implementation of the update to the LTCP, along with other permit requirements, will enhance the ecological integrity of waterways by maintaining and improving storm water and sanitary infrastructure and stream system health to minimize environmental impacts.

### EXTERNAL OR INTERNAL ADOPTED PLAN OR RECOMMENDATION

TES Strategic Plan: Key Result Area - Meet or exceed state federal requirements of the City's MS4 and combined sewer permits; Eco-City Charter

### ADDITIONAL OPERATING IMPACTS

No additional operating impacts identified at this time.

## FOUR MILE RUN SANITARY SEWER REPAIR

DOCUMENT SUBSECTION: Sanitary Sewers

PROJECT LOCATION: End of Commonwealth Ave.  
to Bruce St.MANAGING DEPARTMENT: Department of Transportation  
and Environmental Services

REPORTING AREA: Potomac West

PRIMARY STRATEGIC THEME: Theme 8: Environmental  
SustainabilityPROJECT CATEGORY: 2  
ESTIMATE USEFUL LIFE: 30+ Years

Four Mile Run Sanitary Sewer Repair													
	A (B + M)	B	C	D	E	F	G	H	I	J	K	L	M (C:L)
	Total Budget & Financing	Through 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Total FY 2018 - FY 2027
Expenditure Budget	2,500,000	2,500,000	0	0	0	0	0	0	0	0	0	0	0
Financing Plan													
Sanitary Sewer Fund	0	0	0	0	0	0	0	0	0	0	0	0	0
GO Bonds - Sanitary Sewer	800,000	800,000	0	0	0	0	0	0	0	0	0	0	0
Sanitary Sewer Fees	1,700,000	1,700,000	0	0	0	0	0	0	0	0	0	0	0
Total Financing Plan	2,500,000	2,500,000	0	0	0	0	0	0	0	0	0	0	0
Additional Operating Impact													
Annual Impact	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Additional Operating Impact	0	0	0	0	0	0	0	0	0	0	0	0	0

### CHANGES FROM PRIOR YEAR CIP

No changes from prior CIP.

### PROJECT DESCRIPTION & JUSTIFICATION

This project will fund the rehabilitation of the Four Mile Run sanitary sewer. During field inspections of the Four Mile Run Inflow and Infiltration project in FY 2001, surcharged manholes with significant solids were encountered along the 36-inch diameter trunk sewer upstream of the Four Mile Run pump station. Efforts to clean the trunk sewer were unsuccessful due to the heavy solids volume and compaction in the sewer. In FY 2008, a specialty contractor successfully removed the solids and an inspection and condition assessment was completed. Based on the condition assessment of the trunk sewer following the removal of the solids, rehabilitation is necessary.

Total project costs are estimated at \$2.5 million, and include planning, design and engineering, construction management, and construction. The project is currently in the design phase and construction is scheduled to start in FY 2017.

Completion of this project will improve the City's sanitary sewer infrastructure and extend its useful life, reducing potential pipe collapse and other emergency repairs.

### EXTERNAL OR INTERNAL ADOPTED PLAN OR RECOMMENDATION

Sanitary Sewer Master Plan

### ADDITIONAL OPERATING IMPACTS

No additional operating impacts identified at this time.

## HOLMES RUN TRUNK SEWER

DOCUMENT SUBSECTION: Sanitary Sewers

PROJECT LOCATION: AlexRenew Plant to the City/Fairfax Border

MANAGING DEPARTMENT: Department of Transportation and Environmental Services

REPORTING AREA: Landmark/Van Dorn

PRIMARY STRATEGIC THEME: Theme 8: Environmental Sustainability

PROJECT CATEGORY: 3  
ESTIMATE USEFUL LIFE: 30+ Years

Holmes Run Trunk Sewer													
	A (B + M)	B	C	D	E	F	G	H	I	J	K	L	M (C:L)
	Total Budget & Financing	Through 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Total FY 2018 FY 2027
Expenditure Budget	9,002,000	9,002,000	0	0	0	0	0	0	0	0	0	0	0
Financing Plan													
Sanitary Sewer Fund	0	0	0	0	0	0	0	0	0	0	0	0	0
Prior City Funding	500,000	500,000	0	0	0	0	0	0	0	0	0	0	0
GO Bonds - Sanitary Sewer	4,200,000	4,200,000	0	0	0	0	0	0	0	0	0	0	0
Sanitary Sewer Fees	4,302,000	4,302,000	0	0	0	0	0	0	0	0	0	0	0
Total Financing Plan	9,002,000	9,002,000	0	0	0	0	0	0	0	0	0	0	0
Additional Operating Impact													
Annual Impact	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Additional Operating Impact	0	0	0	0	0	0	0	0	0	0	0	0	0

### CHANGES FROM PRIOR YEAR CIP

No changes from prior CIP.

### PROJECT DESCRIPTION & JUSTIFICATION

This project provides for an increase in capacity in the Holmes Run Trunk Sewer line, which is owned and operated by Alexandria Renew Enterprises (AlexRenew). Both the City and Fairfax County send wastewater flows to this sewer and share in the capacity of this sewer.

Increased capacity is required to support development occurring in the Eisenhower Valley, as well as future development and redevelopment in the West End. Engineering studies indicated that lining the existing sewer with specialized materials would address some capacity problems. In 2008, Phase I of this project included relining the western portion of the trunk sewer from I-395 to Cameron Run. Additional engineering and analysis has determined that pipe lining alone will not increase capacity issues specifically related to wet weather sufficiently in the Phase II – East Eisenhower section. A study has been completed that recommends the construction of a Wet Weather Management Facility to address wet weather capacity issues in the East Eisenhower area and to prevent basement back-ups and sanitary sewer overflows. This wet weather management strategy was later integrated into the City's Long Term Control Plan Update for controlling combined sewer discharges from the two combined sewer outfalls located in Hooffs Run.

The City is currently in discussions with AlexRenew and Fairfax County on developing a cost share agreement for proposed wet weather and combined sewer facilities. Engineering analysis between the City, Fairfax County, and AlexRenew was completed in FY 2017 which evaluated capacity issues in the Holmes Run Trunk Sewer upstream of I-395, which provided two recommendations for addressing the remaining capacity issues in this sewer, including (1) construction of a storage tank in the Dowden Terrace sewershed in Fairfax County and (2) enlargement of an existing parallel Fairfax County Holmes Run Sewer to divert flows from the AlexRenew Holmes Run Trunk Sewer.

A total of \$9.0 million from the sanitary sewer fund has been budgeted in prior fiscal years for this project. Following the cost share agreement on the wet weather and combined sewer facilities that will address wet weather capacity issues in the Eisenhower Valley, it is anticipated that the City, County and AlexRenew will begin discussions regarding remaining capacity issues on the Holmes Run Trunk Sewer. Depending on the outcome of these discussions, additional funding may be required in future years for both design and construction.

Completion of this project will improve the City's sanitary sewer infrastructure, which will help mitigate any potential sanitary sewer overflows during periods of wet weather. Additionally, the project will improve the City's readiness for accommodating quality economic growth.

### EXTERNAL OR INTERNAL ADOPTED PLAN OR RECOMMENDATION

Sanitary Sewer Master Plan

### ADDITIONAL OPERATING IMPACTS

No additional operating impacts identified at this time.

## RECONSTRUCTIONS & EXTENSIONS OF SANITARY SEWERS

**DOCUMENT SUBSECTION:** Sanitary Sewers  
**MANAGING DEPARTMENT:** Department of Transportation  
 and Environmental Services

**PROJECT LOCATION:** Citywide  
**REPORTING AREA:** Citywide

**PRIMARY STRATEGIC THEME:** Theme 8: Environmental  
 Sustainability

**PROJECT CATEGORY:** 1  
**ESTIMATE USEFUL LIFE:** 30+ Years

Reconstructions & Extensions of Sanitary Sewers													
	A (B + M)	B	C	D	E	F	G	H	I	J	K	L	M (C:L)
	Total Budget & Financing	Through 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Total FY 2018 - FY 2027
Expenditure Budget	21,792,959	12,792,959	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	9,000,000
Financing Plan													
GO Bonds (Sanitary)	5,000,000	0	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	5,000,000
Sanitary Sewer Fund	4,000,000	0	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	4,000,000
GO Bonds - Sanitary Sewer	1,173,708	1,173,708	0	0	0	0	0	0	0	0	0	0	0
Sanitary Sewer Fees	11,619,251	11,619,251	0	0	0	0	0	0	0	0	0	0	0
Total Financing Plan	21,792,959	12,792,959	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	9,000,000
Additional Operating Impact													
Annual Impact	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Additional Operating Impact	0	0	0	0	0	0	0	0	0	0	0	0	0

### CHANGES FROM PRIOR YEAR CIP

Funding added for FY 2027.

### PROJECT DESCRIPTION & JUSTIFICATION

This project provides for the construction of new sewer mains, the replacement and rehabilitation of old lines as needed, repairs to City streets disturbed by sewer line repairs, and reconstruction and funds for the City's share of the cost of sewer extensions required for development.

Prior year balances along with annual funding in FY 2018 will be utilized to fund multiple projects in this request. Several projects are in early planning stages, while others are currently under design and construction. Obstacles to construction may include the moving of buried utility lines, such as power, water, and gas lines by the various utility owners that if not moved would interfere with the construction.

Projects currently under study/design and scheduled for construction in FY 2018 include:

- Beauregard Street Sanitary Sewer Construction (included with King & Beauregard street intersection improvement project)
- North Alfred Sewer Replacement
- Wheeler Avenue Sewer Replacement
- Lucky Run Exposed Sewer Protection
- Holmes Run Exposed Sewer Protection
- Royal Street Sewer Relocation Project
- Fillmore Street Sewer Replacement Project

Completion of these projects improves the City's sanitary sewer infrastructure while reducing the frequency of unplanned repairs due to deferred maintenance.

### EXTERNAL OR INTERNAL ADOPTED PLAN OR RECOMMENDATION

Sanitary Sewer Master Plan

### ADDITIONAL OPERATING IMPACTS

No additional operating impacts identified at this time.

## WET WEATHER MANAGEMENT FACILITY

**DOCUMENT SUBSECTION:** Sanitary Sewers  
**MANAGING DEPARTMENT:** Department of Transportation  
 and Environmental Services

**PROJECT LOCATION:** Southwest Quadrant  
**REPORTING AREA:** Southwest Quadrant

**PRIMARY STRATEGIC THEME:** Theme 8: Environmental  
 Sustainability

**PROJECT CATEGORY:** 3  
**ESTIMATE USEFUL LIFE:** 21 - 25 Years

Wet Weather Management Facility													
	A (B + M)	B	C	D	E	F	G	H	I	J	K	L	M (C:L)
	Total Budget & Financing	Through 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Total FY 2018 FY 2027
Expenditure Budget	22,250,000	2,250,000	2,250,000	8,750,000	9,000,000	0	0	0	0	0	0	0	20,000,000
Financing Plan													
GO Bonds (Sanitary)	13,395,000	0	2,000,000	5,180,000	6,215,000	0	0	0	0	0	0	0	13,395,000
Interjurisdictional Contributions	6,355,000	0	0	3,570,000	2,785,000	0	0	0	0	0	0	0	6,355,000
Sanitary Sewer Fund	250,000	0	250,000	0	0	0	0	0	0	0	0	0	250,000
GO Bonds - Sanitary Sewer	2,100,000	2,100,000	0	0	0	0	0	0	0	0	0	0	0
Sanitary Sewer Fees	150,000	150,000	0	0	0	0	0	0	0	0	0	0	0
Total Financing Plan	22,250,000	2,250,000	2,250,000	8,750,000	9,000,000	0	0	0	0	0	0	0	20,000,000
Additional Operating Impact													
Annual Impact	2,399,950	0	0	0	0	309,000	318,270	327,818	337,653	358,216	368,962	380,031	2,399,950
Total Additional Operating Impact	2,399,950	0	0	0	0	309,000	318,270	327,818	337,653	358,216	368,962	380,031	2,399,950

### CHANGES FROM PRIOR YEAR CIP

No changes in planned expenditure from the prior CIP. This year, the project funding sources recognize the shared-use and cost of this asset.

### PROJECT DESCRIPTION & JUSTIFICATION

During periods of extreme wet weather, stormwater enters the City's sanitary sewer collection system. This has the potential to lead to sewer back-ups in homes and businesses throughout the City. In addition, wet weather flows in the sewer can cause sanitary sewer overflows (SSOs), where raw sewage is discharged to receiving waters before being treated. Due to a combination of wet weather flow and forecasted growth in the City (and Fairfax County), there is concern that the number of SSOs in the future will increase and create an additional potential for sewer back-ups.

A study was completed in 2010 (and updated in 2012) which recommended a Wet Weather Management Facility to mitigate SSOs and basement back-ups. The facility also would reduce the occurrence of combined sewer overflows (CSOs) from combined sewer outfall CSO-004. The Wet Weather Management Facility includes the following components: increasing the maximum flow at the Alexandria Renew Enterprises (AlexRenew) wastewater treatment facility from 108 to 116 million gallons per day (through primary treatment), relocation of CSO-004 from Duke Street to just outside the AlexRenew plant, construction of a 1.6 million gallon storage tunnel, and wet weather pumping to reduce the surcharging in the interceptor sewers to prevent back-ups.

This project would complete a portion of the work required by the recent state mandates regarding the City's four CSO's, but this would be in addition to the \$370 million planned for the four combined sewer outfalls.

Current CIP funding includes the cost of the 2012 proposed Wet Weather Management Facility. With respect to wet weather and combined sewer facilities, it is anticipated that the costs would be shared between Fairfax County and the City. These discussions between the City, County and AlexRenew are currently ongoing.

This project provides a number of benefits including reducing sanitary sewer backups into homes and business, reducing the impact that sanitary sewer that SSOs and CSOs have on the environment, and addressing the Hunting Creek TMDL for the two combined sewer outfalls that discharge into Hooffs Run.

### EXTERNAL OR INTERNAL ADOPTED PLAN OR RECOMMENDATION

Sanitary Sewer Master Plan; City's Long Term Control Plan  
 Update for the Combined Sewer System

### ADDITIONAL OPERATING IMPACTS

The annual operating and maintenance costs associated with the facility includes electricity costs associated with the wet weather pumping, labor and equipment rental for the tunnel cleaning and inspection, and equipment replacement costs. Costs were increased 3% annually to adjust for inflation.